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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/607,789	06/30/2000	Kyeong-Jun Kim	678-506 (P9382)	1168

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EXAMINER

CHOW, CHARLES CHIANG

ART UNIT	PAPER NUMBER
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2685

DATE MAILED: 07/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/607,789

Applicant(s)

KIM ET AL.

Examiner

Charles Chow

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 April 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

**Office Action for RCE
Received on 5/17/2004**

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claim 1-2, 6-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson, Jr. (US 4,868,576) in view of Chatzipetros (US 5,554,996).

Regarding **claim 1**, Johnson, Jr. (Johnson) teaches a portable radio terminal apparatus (100 in Figure) including a terminal body (121-122 in Figure, col. 2, lines 16-17) and an antenna (extendable antenna system with radiator 102, col. 2, lines 12-13), wherein said portable radio terminal's overall length is less than 1/2 length (an improved extendable antenna system for cellular telephones which is shorter in length than a traditional half-wavelength antenna, col. 1, lines 57-63; col. 3, lines 60-63), Johnson teach a transmission line (302, Figure) connected to a printed circuit board disposed within the terminal body (the circuit board 310, col. 3, line 47-59), thereby shifting a peak current distribution point and reducing the peak current radiated from the peak current distribution point (diverting, decoupling, the antenna, signal, currents from the bottom housing ground, to minimizing radiation problem, col. 3, lines 32-46). Johnson does not teach the conductor connected to a printed circuit board such that an electrical equivalent length of the portable terminal radio terminal is 1/2 wavelength.

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However, Chatzipetros teaches a conductor (116 located in flap 104, Fig. 1) connected to a printed circuit board (connected to substrate board 206 via direct feed 202, Fig. 2, col. 2, lines 46-61) disposed within the terminal body such that an electrical equivalent length of the portable terminal radio terminal is $1/2$ wavelength (the direct feed portion 202 can be in increments of quarter wavelength, col. 3, lines 13-21, such that the electrical length of the radio handset 100 is $1/2$ wavelength).

Chatzipetros teaches an improved antenna interconnection technique for incorporating an antenna inside flap, with efficiency to reduce the assembly time and cost for manufacturing (col. 1, lines 41-44), for maintaining the antenna diversity (abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Johnson, and include Chatzipetros' direct feed portion 202 for interconnecting to antenna, such that the electrical wavelength of the cellular phone could be controlled and built with the adjustable interconnection feed portion.

Regarding **claim 2**, Johnson teaches the conductor comprising a flat conductive board (310, Figure, col. 3, 47-59).

Regarding **claim 6**, Johnson teaches a portable radio terminal apparatus (100 in Figure) including a terminal body (121-122 in Figure, col. 2, lines 16-17), an antenna (extendable antenna system with radiator 102, col. 2, lines 12-13), Johnson teaches the portable terminal comprising a transmission line (302, Figure) connected to a printed circuit board disposed within the terminal body (the circuit board 310, col. 3, line 47-59), thereby shifting a peak current distribution point and reducing the peak current radiated from the peak current distribution point (diverting, decoupling, the

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antenna, signal, currents from the bottom housing ground, to minimizing radiation problem, col. 3, lines 32-46).

Johnson does not teach the flip integrated with a conductor so that an equivalent ground length formed by terminal body, the antenna and flip is longer than $1/4$ wavelength. However, Chatzipetros teaches the flip (104) having antenna 116 interconnected with the direct feed 202 (Fig.2), the direct feed 202 can have incrementing electrical wavelength of one quarter wavelength (col. 3, lines 13-21), so that by adding the direct feed 202, it can make the equivalent ground length formed by radio handset 100, antenna and flap 104 longer than $1/4$ wavelength, by incrementing 202 in quarter wavelength. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Johnson, and include Chatzipetros' direct feed portion 202 for interconnecting to antenna, such that the electrical wavelength of the cellular phone could be controlled and built with the adjustable interconnection feed portion.

Regarding **claim 7**, Chatzipetros taught above the conductive is inserted within a flip, by imbedding the conductive material into the plastic flap 104 (col. 2, lines 34-40).

Regarding **claim 8**, Chatzipetros taught above the conductive paint for the parasitic radiator 116 (col. 2, lines 62-67) for applicant's claimed conductive pigments.

Regarding **claim 9**, Chatzipetros taught above the parasitic radiator 116 is a conductive copper sticker tape to flap 104 (col. 2, lines 62-67).

Regarding **claim 10**, Johnson teaches a portable radio terminal apparatus (100 in Figure) including a terminal body (121-122 in Figure, col. 2, lines 16-17), an antenna (extendable antenna system with radiator 102, col. 2, lines 12-13), Johnson teaches

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the portable terminal comprising a transmission line (302, Figure) connected to a printed circuit board disposed within the terminal body (the circuit board 310, col. 3, line 47-59), thereby shifting a peak current distribution point and reducing the peak current radiated from the peak current distribution point (diverting, decoupling, the antenna, signal, currents from the bottom housing ground, to minimizing radiation problem, col. 3, lines 32-46).

Johnson does not teach the flip integrated with a conductor so that an equivalent ground length formed by terminal body, the antenna and flip is $1/2$ wavelength.

However, Chatzipetros teaches the flip (104) having antenna 116 interconnected with the direct feed 202 (Fig.2), the direct feed 202 can have incrementing electrical wavelength of one quarter wavelength (col. 3, lines 13-21), so that by adding the direct feed 202, it can make the equivalent ground length formed by radio handset 100, antenna and flap 104 to be $1/2$ wavelength, by incrementing 202 in quarter wavelength. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Johnson, and include Chatzipetros' direct feed portion 202 for interconnecting to antenna, such that the electrical wavelength of the cellular phone could be controlled and built with the adjustable interconnection feed portion.

2. Claims 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson in view of Chatzipetros, as applied to claim 1 above, and further in view of Phillips et al. (US 5,572,223).

Regarding **claim 3**, Johnson and Chatzipetros do not teach the strip line.

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Phillips teaches the parasitic radiator 1668 is a thin conductive element on the dielectric 1667 having ground plane 1666 (col. 8, lines 39-54). The thin conductive element on the dielectric layer having ground is applicant's claimed strip line. Phillips teaches the conductor connected to the printed circuit board for high antenna performance (In Fig. 23, the patch radiator 1601 is a conductor which is connected to the board 314 through ground pins 1969, at the ground plane 1666; col. 8, lines 41-43; col. 8, line 62 to col. 9, line 9), the different shaped parasitic radiators (Fig. 7-12) which couples to the flap antenna for high antenna performance for a small pocket size antenna (abstract, col. 1, lines 26-31; col. 1, line 65 to col. 2, line 2; col. 7, lines 36-52; col. 3, lines 29-43; and in his claim 1). Phillips teaches the technique for high performance small antenna having parasitic radiator connected to board 314, such that the antenna performance could be improved with parasitic radiator. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify and include Phillips' parasitic radiator connected to the board, to Takei as modified above, such that the antenna performance could be improved with parasitic radiator.

Regarding **claim 4**, Phillips has shown above in claim 1, the conductor extending in a straight line from board 314 via ground pins 1969, as shown in Fig. 23, the quarter wavelength parasitic patch radiator 1601 which is a straight line. Phillips also shown the straight line in Fig. 19, Fig. 20.

Regarding **claim 5**, Phillips has taught above in claim 1, the closed loop conductor 1200 in Fig. 12, col. 7, lines 36-52.

Response to Arguments

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3. Applicant's arguments with respect to claims 1-10 have been considered but are moot in view of the new ground(s) of rejection.

Regarding applicant's Request for Continued Examination, the ground of rejection has been changed by utilizing Johnson, Jr. (US 4,868,576) and Chatzipetros (US 5,554,996).

Regarding the argument for thereby shifting a peak current distribution point and reducing the peak current radiated from the peak current distribution point, Johnson teaches the portable terminal comprising a transmission line (302, Figure) connected to a printed circuit board disposed within the terminal body (the circuit board 310, col. 3, line 47-59), diverting, decoupling, the antenna, signal, currents from the bottom housing ground, to minimizing radiation problem (col. 3, lines 32-46), thereby shifting a peak current distribution point and reducing the peak current radiated from the peak current distribution point.

Regarding a conductor to a printed circuit board such that the electrical equivalent length of the portable terminal is $1/2$ wavelength, Chatzipetros teaches the feed conductor 202 (Fig.2) interconnected to printed circuit board 206 (col. 3, line 2) and coupled to antenna 116 in flap 104. The feed conductor 202, having incrementing electrical wavelength of quarter wavelength (col. 3, lines 13-21), which makes the electrical equivalent length of the portable terminal to be the $1/2$ wavelength by incrementing the wavelength of the conductor 202.

Besides, the independent claims are quite general for the claimed features, and there is no detailed relationship for the conductor against antenna and the peak current.

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4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles Chow whose telephone number is (703)-306-5615. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Urban, can be reached at (703)-305-4385.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to: (703) 872-9306 (for Technology Center 2600 only)


Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

Charles Chow C.C.

June 23, 2004.


EDWARD F. URBAN
SENIOR PATENT EXAMINER
TECHNOLOGY CENTER 2600